

APPENDIX A

ESF SAMPLES COLLECTED FOR ³⁶Cl ANALYSIS,
FEBRUARY 1995 TO JANUARY 1997

LANL ID	Approx. ESF station	SMF barcode	Analytical status for ³⁶ Cl (see footnote 1)	Sampled feature (Preliminary)	Preliminary field description (see footnote 2)
E001	1+98	507923	App. B	Fault zone	Bow Ridge Fault, Tiva Canyon tuff wallrock, ~1 m into footwall (collected by U.S. Bureau of Reclamation)
E002	2+00	507933	NA, Contam	Fault zone	Bow Ridge Fault, from fault zone (collected by U.S. Bureau of Reclamation)
E003	2+00	507932	NA, Contam	Fault zone	Bow Ridge Fault, from fault zone (collected by U.S. Bureau of Reclamation)
E004	2+00	507931	NA, Contam	Fault zone	Bow Ridge Fault, from fault zone (collected by U.S. Bureau of Reclamation)
E005	2+01	507930	NA, Contam	Fault zone	Bow Ridge Fault, from fault zone (collected by U.S. Bureau of Reclamation)
E006	2+02	507925	NA, Contam	Fault zone	Bow Ridge Fault, from fault zone (collected by U.S. Bureau of Reclamation)
E007	2+03	507924	App. B	Fault zone	Bow Ridge Fault, pre-Rainier Mesa tuff wall rock, zeolitic, ~1 m into hanging wall (collected by U.S. Bureau of Reclamation)
E008	2+00	509016	App. B	Fault zone	Bow Ridge Fault, fault gouge (collected by U.S. Bureau of Reclamation)
E009	2+00	509017	App. B	Fault zone	Bow Ridge Fault, fault gouge (collected by U.S. Bureau of Reclamation)
E010	2+00	509018	App. B	Fault zone	Bow Ridge Fault, fault gouge (collected by U.S. Bureau of Reclamation)
E011	2+00	509019	App. B	Fault zone	Bow Ridge Fault, rubble/fault gouge (collected by U.S. Bureau of Reclamation)
E012	2+00	509020	App. B	Fault zone	Bow Ridge Fault, fault gouge (collected by U.S. Bureau of Reclamation)
E013	7+59	509064	NA	Fracture	Opal and calcite (100 g) from fracture oriented 188/76 (collected by U.S. Bureau of Reclamation)
E014	7+33	509068	NA	Fracture	Breccia (?) fracture filling (100 g) from fracture oriented 202/77 (collected by U.S. Bureau of Reclamation)
E015	7+87	509073	NA	Fracture	Calcite and opal (100 g) from fracture oriented 187/76 (collected by U.S. Bureau of Reclamation)
E016	16+00	509248	Min. R&D	Fracture	Bulk rock; calcite and opal in fracture
E017	21+65	509228	NA	Lith cavity	Cavity in otherwise unfractured rock
E018	22+72	509226	NA	Fault breccia	Breccia cement
E019	24+38	509222	NA	Lith cavity	Cavity intercepted by cooling joint
E020	24+68	509220	App. B	Fracture	Partly syngenetic rubbly breccia in TSw, fracture surfaces coated with vapor-phase silica
E021	26+88	509251	NA	Lith cavity	Silica lining and halo surrounding cavity
E022	26+95	509253	NA	Fracture	Calcite-filled fracture, possibly cooling joint
E023	27+18	509218	NA	Lith cavity	Cavity adjacent to fault
E024	28+80	509215	NA	Lith cavity	Calcite from cavity
E025	28+80	509215	NA	Bedrock	Rock adjacent to above cavity
E027	11+00	503935	Inconsistent results	Systematic	Systematic sampling of TSw bedrock

APPENDIX A (continued)

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E028	12+44	503934	App. B	Cooling joints	Vertical cooling joints and intervening horizontal cooling joints
E029	13+00	503932	App. B	Systematic	Systematic sampling of TSw bedrock
E030	13+67	503931	App. B	Cooling joints	Weakly cemented rubble from shear zone at intersection with another shear zone
E031	14+00	503930	App. B	Shear zone	Broken rock from shear zone
E032	14+14	503929	App. B	Shear zone	Broken rock from shear zone
E033	14+41	503928	App. B	Fault	Calcite-cemented breccia from fault at intersection with fracture
E034	15+00	503926	App. B	Systematic	Systematic sampling of TSw bedrock
E035	15+05	503925	App. B	Fracture	Calcite lining fracture; calcite-cemented breccia
E036	16+12	509242	App. B	Cooling joint	Separated cooling joint with calcite infilling
E037	16+19	509241	App. B	Fracture	Clay-rich fracture fill
E038	17+00	503924	App. B	Systematic	Systematic sampling of TSw bedrock
E039	17+11	503923	NA	Fracture	Calcite and broken rock from fracture
E040	18+96	503922	App. B	Broken rock	Bedrock cut by many short-segment, high-angle cooling cracks
E041	19+00	503921	App. B	Systematic	Systematic sampling of TSw bedrock
E042	19+31	503920	App. B	Breccia zone	Bulk broken rock and breccia
E043	19+37	503919	App. B	Fault zone	Bulk broken rock and breccia
E044	19+42	503918	App. B	Breccia zone	3-m wide syngenetic rubbly zone, bounded by vertical fractures, with widespread calcite cement
E045	21+00	503917	App. B	Systematic	Systematic sampling of TSw bedrock
E046	22+71	503916	App. B	Fracture zone	Near-vertical fracture zone about 6-m wide; 40% of rock is lithophysal cavities
E047	23+00	509247	App. B	Systematic	Systematic sampling of TSw bedrock
E048	23+86	509246	NA	Fracture	Broken rock
E049	24+37	509245	NA	Cooling joint	Broken rock between 2 cooling joints
E050	24+40	509240	App. B	Fault zone	Uncemented fault gouge from a near-vertical fault following an old cooling crack
E051	25+00	509259	App. B	Systematic	Systematic sampling of TSw bedrock
E052	26+79	509244	App. B	Shear zone?	Broken rock from 1-meter wide cooling joint zone
E053	26+88	509239	Min. R&D	Cooling joint	Calcite-filled cooling joint in lithophysal zone
E054	27+00	509257	App. B	Systematic	Systematic sampling of TSw bedrock
E055	Alcove #1	500788	NA	R&D	Representative of drill and blast construction
E056	27+18	509243	App. B	Fault	Broken rock from fault separating TSw1 and TSw2
E057	27+50	509238	App. B	Fracture	Breccia from fracture, with weak calcite veinlets throughout
E058	27+66	509237	App. B	Fault	Fault gouge consisting of clay and breccia with trace of calcite
E059	28+40	509236	App. B	Fault	Fault zone with carbonate-cemented breccia
E060	Alcove #2	510542	NA	Fracture	Calcite, 200 g (collected by U.S. Bureau of Reclamation)
E061	Alcove #2	510536	NA	Shear zone	Calcite-cemented breccia, 200 g (U.S. Bureau of Reclamation)

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E062	1+56	507945	NA	Fracture	Coarse calcite crystals (100 g) from fracture oriented 190/71 (U.S. Bureau of Reclamation)
E063	1+62	507940	NA	Fracture	Calcite from fractured zone, 200 g (U.S. Bureau of Reclamation)
E064	2+62	508437	NA	Mineralogy	Chert nodules (200 g) from basal-most portion of the Pre-Rainier tuff at the contact with the underlying Tuff X unit (U.S. Bureau of Reclamation)
E065	3+24	508410	NA	Mineralogy	Windblown silt (?) layer (100 g) in basal Tuff X unit; 1.2 m above contact with underlying Pre-Tuff X unit (U.S. Bureau of Reclamation)
E066	3+69	508373	NA	Lithophysae	Lithophysal infilling, 200 g (U.S. Bureau of Reclamation)
E067	3+70	508431	NA		Weathered pumice (?) with quartz crystals, 0.5 kg (U.S. Bureau of Reclamation)
E068	3+75	508367	NA		Calcite + opal + quartz, 200 g (U.S. Bureau of Reclamation)
E069	4+18	508330	NA		Pumice + vapor phase mineralization, 5 g (U.S. Bureau of Reclamation)
E070	4+37	508304	NA	Fault	Fault breccia, 200 g (U.S. Bureau of Reclamation)
E071	4+42	508298	NA	Fault	Fault breccia, 200 g (U.S. Bureau of Reclamation)
E072	4+64	508273	NA	Lithophysae	Vapor phase mineralization, 100 g, from lithophysae (U.S. Bureau of Reclamation)
E073	5+04	504280	App. B	Fracture	Breccia from fracture oriented 165/71 (U.S. Bureau of Reclamation)
E074	5+05	503866	App. B	Fracture	Breccia from fracture oriented 185/69 (U.S. Bureau of Reclamation)
E075	8+24	504284	NA	Fracture	Opal and vitrophyre (?) fracture filling from fracture oriented 220/84 (U.S. Bureau of Reclamation)
E076	8+31	504289	NA	Fracture	Fracture filling (U.S. Bureau of Reclamation)
E077	8+48	504294	NA	Fracture	Opal and tuff fracture filling from fracture oriented 050/77 (U.S. Bureau of Reclamation)
E078	9+89	509103	NA	Fault	Quartz (?) cemented material from fault (U.S. Bureau of Reclamation)
E079	9+94	509109	NA	Fracture	Opal from tuff (U.S. Bureau of Reclamation)
E080	10+08	509114	NA	Fault	Tuff and opal infilling from fault oriented 218/61; west side down ~1.5 m (U.S. Bureau of Reclamation)
E081	10+28	509132	NA	Fracture	Opal (U.S. Bureau of Reclamation)
E082	10+33	509119	NA	Fracture	Opal, adjacent to fault oriented 210/70 (U.S. Bureau of Reclamation)
E083	10+79	510515	NA	Fracture	Quartz/opal (U.S. Bureau of Reclamation)
E084	10+90	510548	NA	Fracture	Quartz (U.S. Bureau of Reclamation)
E085	11+02	510561	NA	Fracture	Wall rock with opal (U.S. Bureau of Reclamation)
E086	11+43	510583	App. B	Bedrock	Unaltered TSw (U.S. Bureau of Reclamation, 1995)
E087	11+44	510581	NA	Fracture	Tuff/clay infilling of fracture, 300 g (U.S. Bureau of Reclamation)
E088	0+87	507974	NA	Bedrock	Upper lithophysal unit (U.S. Bureau of Reclamation)

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E089	1+04	507958	NA	Fracture	From fracture oriented 180/77; fracture filling (1 bag) + intact wall rock ~1 m away (1 bag) (U.S. Bureau of Reclamation)
E090	1+12	507959	NA	Fracture	Fracture oriented 185/78, fracture filling (1 bag, 200 g) (U.S. Bureau of Reclamation)
E091	1+23	507960	NA	Fracture	Rubble/fracture zone (bag 1) + intact unfractured rock adjacent to rubble zone (bag 2) (U.S. Bureau of Reclamation)
E092	1+31	507953	NA	Fault	Fault breccia (1bag) + intact rock within 1 m of fault (1 bag); Fault oriented 160/65 (U.S. Bureau of Reclamation)
E093	1+49	507954	NA	Fault	Fault breccia (1bag) + intact rock within 1 m of fault (1 bag); fault oriented 355/75 (U.S. Bureau of Reclamation)
E094	1+49	507951	NA	Shear zone	Shear breccia (collected by U.S. Bureau of Reclamation)
E095	2+08	507919	NA	Fault	Footwall at fault zone (collected by U.S. Bureau of Reclamation)
E096	2+08	507920	NA	Fault	Hanging wall at fault zone (collected by U.S. Bureau of Reclamation)
E097	2+08	507921	NA	Fault	Infilling in fault zone (collected by U.S. Bureau of Reclamation)
E098	2+08	507922	NA	Fault	Infilling in fault zone (collected by U.S. Bureau of Reclamation)
E099	2+11	507916	NA	Fault	Footwall of fault, within 1 m of fault plane (collected by U.S. Bureau of Reclamation)
E100	2+12	507918	NA	Fault	Sample intersecting fault plane, material from both sides. (collected by U.S. Bureau of Reclamation)
E101	2+13	507917	NA	Fault	Hanging wall of fault, within 1 m of fault plane. (collected by U.S. Bureau of Reclamation)
E102	2+18	507910	NA	Subunit contact	Lithologic contact (3 bags) (collected by U.S. Bureau of Reclamation)
E103	2+62	507906	NA	Contact	Pre-Rainier unit, just above contact with Tuff X unit (collected by U.S. Bureau of Reclamation)
E104	2+62	507907	NA	Contact	Tuff X at contact with Pre-Rainier (collected by U.S. Bureau of Reclamation)
E105	3+26	508415	NA	Contact	Chert (?) nodules from contact between Tuff X and underlying Pre-Tuff X unit (collected by U.S. Bureau of Reclamation)
E106	3+29	508422	NA	Fracture	Fracture filling, 400 g, from fracture oriented 195/84 (collected by U.S. Bureau of Reclamation)
E107	3+64	508378	NA	Fracture	Fracture filling, from fracture oriented 352/82 (collected by U.S. Bureau of Reclamation)
E108	3+99	508314	NA	Fault	Bulk rock within 1 m of fault at Sta 4+00.65 (collected by U.S. Bureau of Reclamation)
E109	4+01	508313	NA	Fault	Bulk rock at fault located at Sta 4+00.65 (collected by U.S. Bureau of Reclamation)

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E110	4+34	508309	NA	Fault	Bulk rock, within 2 m of fault located at Sta 4+36.00 (collected by U.S. Bureau of Reclamation)
E111	4+38	508302	NA	Fault	Bulk rock, within 2 m of fault located at Sta 4+36.80 (collected by U.S. Bureau of Reclamation)
E112	4+43	508294	NA	Fault	Bulk rock within 2 m of fault (collected by U.S. Bureau of Reclamation)
E113	4+78	509100	NA	Shear	Bulk rock within 0.4 m of shear at Sta 4+78.8 (collected by U.S. Bureau of Reclamation)
E114	4+79	509003	NA	Shear	Bulk rock within 0.2 m of shear at Sta 4+78.8 (collected by U.S. Bureau of Reclamation)
E115	4+79	509002	NA	Shear	Material from shear oriented 160/68 (collected by U.S. Bureau of Reclamation)
E116	4+98	503893	NA	Shear	Bulk rock within 1 m of shear (collected by U.S. Bureau of Reclamation)
E117	5+00	503892	NA	Shear	Breccia or shear material (collected by U.S. Bureau of Reclamation)
E118	4+74	508285	NA	Cooling joint	Tubular features on cooling joint oriented 292/85 (collected by U.S. Bureau of Reclamation)
E119	5+03	503837	NA	Fracture	Bulk rock within 1 m of breccia (collected by U.S. Bureau of Reclamation)
E120	5+04	503836	NA	Fracture	Bulk rock within 1 m of breccia (collected by U.S. Bureau of Reclamation)
E121	5+05	503842	NA	Fracture	Bulk rock within 1 m of breccia (collected by U.S. Bureau of Reclamation)
E122	5+06	503838	NA	Fracture	Bulk rock within 1 m of breccia (collected by U.S. Bureau of Reclamation)
E123	5+02	503891	NA	Shear	Wall rock within 1 m of shear (collected by U.S. Bureau of Reclamation)
E124	5+07	503890	NA	Shear	Wall rock within 1 m of shear (collected by U.S. Bureau of Reclamation)
E125	5+13	503886	NA	Shear	Wall rock within 1 m of shear (collected by U.S. Bureau of Reclamation)
E126	10+34	509155	App. B	Fault	Altered tuff bisected by fault oriented at 156/75 (collected by U.S. Bureau of Reclamation)
E127	10+38	509135	NA	Fault	Tuff within 2 m of fault with ~0.5-m offset (collected by U.S. Bureau of Reclamation)
E128	10+40	509147	App. B	Fault	Tuff within 2 m of fault (collected by U.S. Bureau of Reclamation)
E129	10+40	509136	NA	Fault	Tuff within 1 m of fault with ~0.5-m offset (collected by U.S. Bureau of Reclamation)
E130	10+41	509150	App. B	Fault	Tuff bisected by fault plane; fault oriented at 038/64 (collected by U.S. Bureau of Reclamation)
E131	10+42	509137	NA	Fault	Tuff within 2 m of fault with ~0.5-m offset (collected by U.S. Bureau of Reclamation)
E132	10+42	509149	NA	Fault	Tuff within 2 m of fault (collected by U.S. Bureau of Reclamation)

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E133	10+65	509199	NA	Fault	Tuff 0.75 m E of fault (collected by U.S. Bureau of Reclamation)
E134	10+66	510506	NA	Fault	Fault material (collected by U.S. Bureau of Reclamation)
E135	10+66	510507	NA	Fault	Tuff within 0.2 m of fault (collected by U.S. Bureau of Reclamation)
E136	10+67	510505	NA	Fault	Fault material (collected by U.S. Bureau of Reclamation)
E137	10+68	510508	NA	Fault	Tuff within 0.2 m of fault (collected by U.S. Bureau of Reclamation)
E138	10+73	510509	NA	Fault	Tuff within 0.2 m of fault (collected by U.S. Bureau of Reclamation)
E139	10+74	510510	NA	Fault	Fault material (collected by U.S. Bureau of Reclamation)
E140	10+75	510511	NA	Fault	Tuff within 0.35 m of fault (collected by U.S. Bureau of Reclamation)
E141	29+00	503947	App. B	Systematic	Systematic sampling of TSw bedrock
E142	29+21	503983	App. B	Fracture	Subhorizontal fracture zone with calcite
E143	29+65	503948	App. B	Fault	Fault breccia following syngenetic alteration zone
E144	29+73	503949	App. B	Cooling joints	Bulk rock above lithophysal cavity at intersection of cooling joints
E145	29+80	503985	Min. R&D	Lith. cavity	Calcite from lithophysal cavity along cooling joint extending below 29+80 sample site
E146	30+18	503987	App. B	Lith. cavity	Calcite from lithophysal cavity
E147	30+27	503976	App. B	Cooling joints	Broken rock between two cooling joints
E148	31+61	503975	Min. R&D	Cooling joint & lith. cavity	Calcite in incipient lithophysal cavity intersected by two cooling joints
E149	31+64	503973	App. B	Cooling joint	Breccia along cooling joint
E150	33+00	503939	App. B	Systematic	Systematic sampling of TSw bedrock
E151	33+16	503990	App. B	Lith cavity	Cavity with calcite/opal, intersected by vertical cooling joint
E152	34+28	503993	App. B	Fractures	Cooling joints and rubbly rock
E153	34+32	503938	App. B	Cooling joints	Broken rock at the intersection of offset cooling joints
E154	34+71	503937	App. B	Cooling joints	Breccia in offset cooling joint
E155	35+00	503980	App. B	Systematic	Systematic sampling of TSw bedrock
E156	35+00	503969	App. B	Cooling joints	Broken rock with throughgoing cooling joints
E157	35+03	503994	App. B	Cooling joints	Calcite breccia cement in separated cooling joints
E158	35+08	503995	App. B	Cooling joints	Breccia bounded by high-angle cooling joints
E159	35+24	503997	Min. R&D	Cooling joint	Calcite from near-vertical cooling joint and adjacent breccia

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E160	35+45	503979	App. B	Cooling joints	Broken rock from a zone of vertical cooling joints
E161	35+58	503999	App. B	Cooling joints	Breccia zone bounded by high-angle cooling joint
E162	28+81	503981	Min. R&D	Fracture	Calcite fracture filling
E163	4+94	512551	App. B	Systematic	Systematic sampling of TCw bedrock
E164	7+00	512550	App. B	Systematic	Systematic sampling of TCw bedrock
E165	7+70	512549	App. B	TCw contact	Tpcpln/Tpcpv contact, ~ 1 m above contact
E166	7+70	512548	App. B	TCw contact	Tpcpln/Tpcpv contact
E167	7+70	512547	App. B	TCw contact	Tpcpln/Tpcpv contact, ~ 1 m below contact
E168	8+59	512546	App. B	PTn contact	Tpcpv/Tpbt4 contact, ~ 1 m above contact
E169	8+59	512545	App. B	PTn contact	Tpcpv/Tpbt4 contact
E170	8+59	512544	App. B	PTn contact	Tpcpv/Tpbt4 contact, ~ 1 m below contact
E171	8+90	512554	App. B	PTn contact	Tpbt3/Tpp contact, ~ 1 m above contact
E172	8+90	512553	App. B	PTn contact	Tpbt3/Tpp contact
E173	8+90	512552	App. B	PTn contact	Tpbt3/Tpp contact, ~ 1 m below contact
E174	9+00	512543	App. B	Systematic	Systematic sampling of PTn bedrock
E175	35+93	512511	App. B	Fault	Breccia (possibly Sundance Fault)
E176	36+55	512506	App. B	Fault	Fault gouge
E177	37+00	512510	App. B	Systematic	Systematic sampling of TSw bedrock
E178	37+60	512504	App. B	Cooling joint	Fault gouge within modified cooling joint
E179	37+68	512509	App. B	Cooling joint	Wallrock and breccia adjacent to cooling joint
E180	38+47	512513	NA	Fracture	Fracture and fracture fill minerals
E181	38+62	512515	NA	Lith cavity	Bulk rock and lithophysal cavity
E182	38+79	512502	App. B	Fracture	Fracture material/gouge
E183	38+95	512517	App. B	Cooling joint	Fracture fill/gouge
E184	39+00	512508	App. B	Systematic	Systematic sampling of TSw bedrock (fractured rock)
E185	39+39	503944	App. B	Fracture/lith. cavity	Lithophysal cavity with calcite
E186	39+47	503943	App. B	Cooling joint	Gouge within offset cooling joint
E187	39+61	503946	App. B	Cooling joint	Gouge within offset cooling joint
E188	8+26	515100	App. B	PTn contact with fracture	Tpcpv1/Tpbt4 contact, ~1 m above contact, with fracture/fault crossing contact
E189	8+26	515101	App. B	PTn contact	Tpcpv1/Tpbt4 contact, just above contact
E190	8+26	515102	App. B	PTn contact	Tpcpv1/Tpbt4 contact, ~1 m below contact
E191	8+75	515104	App. B	PTn contact	Tpbt3, ~ 1 m above contact between coarse and fine subunits
E192	8+75	515105	App. B	PTn contact	Tpbt3, at contact between coarse and fine subunits
E193	8+75	515106	App. B	PTn contact	Tpbt3, ~ 1 m below contact between coarse and fine subunits
E194	10+56	512586	App. B	PTn contact	Tprv2/Tprv1 contact, ~ 2 m above contact, adjacent to NRG-4
E195	10+56	512587	App. B	PTn contact	Tprv2/Tprv1 contact, ~ 1 m above contact, adjacent to NRG-4
E196	10+56	512588	App. B	PTn contact	Tprv2/Tprv1 contact, at contact, adjacent to NRG-4

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E197	10+62	512585	App. B	PTn contact	Tprv2/Tprv1 contact, ~ 1 m below contact, adjacent to NRG-4; vitric tuff
E198	41+65	510700	App. B	Cooling joint	Broken rock with cooling joints
E199	43+00	512590	App. B	Systematic	Systematic sampling of TSw bedrock
E200	43+39	512589	App. B	Fault	Gouge zone with minor offset bounded by cooling joints
E201	43+63	512591	App. B	Cooling joint	Hard rock cut by cooling joints
E202	42+20	512592	App. B	Cooling joints	Multiple cooling joint sets
E203	44+21	512593	App. B	Cooling joints	Multiple cooling joint sets
E204	44+22	512594	App. B	Cooling joint	Thin breccia layer along cooling joint
E205	45+00	512595	App. B	Systematic	Systematic sampling of TSw bedrock
E206	45+78	512596	NA	Cooling joints	Calcite along cooling joints
E207	45+79	512597	App. B	Cooling joints	Multiple cooling joint sets
E208	46+18	515103	NA	Fault	Clayey gouge
E209	46+18	512598	NA	Fault	Calcite cement
E210	Alcove #4	515109	App. B	PTn contact	Station 0+51.58, ~2.3 m above red argillic horizon
E211	Alcove #4	515107	App. B	PTn contact	Station 0+51.58, in red argillic horizon
E212	Alcove #4	515108	App. B	PTn contact	Station 0+51.58, below red argillic horizon
E213	12+36	510792	App. B	Fracture	0.5 to 1-m wide fracture-breccia zone
E214	12+44	510790	App. B	Cooling joints	Resampling of sample E028
E215	12+49	510791	App. B	Cooling joints	Broken rock adjacent to cooling joints
E216	20+71	510788	App. B	Fault zone	Broken rock, little secondary mineralization
E217	26+19	510716	App. B	Fracture	
E218	26+36	510714	App. B	Fracture	Several closely-spaced fractures with secondary mineralization
E219	26+46	510713	App. B	Fracture	High-angle fracture with secondary mineralization
E220	26+79	510719	App. B	Fracture/fault	Fracture/fault zone in lithophysal tuff
E221	41+00	510710	App. B	Systematic	Systematic sampling of TSw bedrock
E222	42+55	510724	App. B	Shear	Intersecting shear sets: host rock (1 bag); gouge (1 bag)
E223	47+00	510728	App. B	Systematic	Systematic sampling of TSw bedrock
E224	49+00	510734	App. B	Systematic	Systematic sampling of TSw bedrock
E225	48+56	510731	App. B	Cooling joints	Breccia zone bounded by cooling joints
E226	49+56	510737	App. B	Cooling joint	Breccia along cooling joint
E227	49+89	510705	App. B	Cooling joints	Breccia zone bounded by cooling joints

APPENDIX A (continued)

**ESF SAMPLES COLLECTED FOR ^{36}Cl ANALYSIS,
FEBRUARY 1995 TO JANUARY 1997**

LANL ID	Approx. ESF station	SMF barcode	Analytical status for ^{36}Cl (see footnote 1)	Sampled feature (Preliminary)	Preliminary field description (see footnote 2)
E228	Alcove #2	510795	App. B	Bulk rock, drill and blast construction	Station 0+25.5 in alcove; objective is to evaluate effects of drill and blast construction on ^{36}Cl and halide signals
E229	Alcove #3	510702	App. B	Monitoring	Adjacent to USGS moisture probe site. Station 0+14.5 in alcove; objective is to compare ^{36}Cl signal to flux measurements at this location
E230	51+00	510739	App. B	Systematic	Bedrock cut by several sets of cooling joints
E231	51+07	510740	App. B	Cooling joints	Broken rock/breccia at intersection of cooling joints
E232	51+33	510741	App. B	Cooling joints	Intersection of cooling joints with calcite joint filling
E233	51+73	510742	App. B	Fracture	Broken rock zone bounded by fracture
E234	52+43	510743	App. B	Cooling joint	Joint surfaces with calcite and fluorite
E235	52+46	510744	App. B	Cooling joint	Joint surfaces and adjacent bedrock
E236	53+00	510745	App. B	Systematic	Bedrock cut by rare vertical cooling joint
E237	53+61	510746	App. B	Cooling joints	Broken rock between cooling joints
E238	54+20	510747	App. B	Cooling joints	Breccia at intersection of cooling joints
E239	55+00	510748	App. B	Systematic	Fractured bedrock
E240	56+63	510756	App. B	Cooling joints	Breccia zone bounded by cooling joints
E241	56+85	510754	App. B	Cooling joints	Breccia/shear zone between cooling joints
E242	56+93	510750	App. B	Cooling joints	Breccia/shear zone between cooling joints
E243	1+99	509751	App. B	Fault zone	Bow Ridge Fault, gouge (resampled in vicinity of E012)
E244	8+38	515135	App. B	Fault	Fault in TCw with 1 m offset
E245	8+44	515136	App. B	Fracture	Fe-stained fracture at base of TCw (only Fe-stained frax in ESF)
E246	8+66	515137	App. B	Fault	Fault at top of PTn with 1 m offset
E247	9+32	515138	App. B	Fault	Fault in PTn
E248	10+75	515139	App. B	Fault	Fault in TSw, dies out about 3 m into PTn; associated calcite
E249	11+00	515142	App. B	Systematic	Resample of E027
E250	11+43	515140	App. B	Fault	Through-going fault at TSw/PTn contact
E251	11+77	515141	App. B	Fault	TSw/PTn fault with 7-8 m offset
E252	57+00	515143	App. B	Systematic	Systematic sample
E253	57+27	515144	App. B	Fault	Ghost Dance Fault
E254	58+66	515145	App. B	Fault	Fault zone gouge, ~0.5-m wide
E255	58+77	515146	App. B	Unit contact	Nonfractured lower lithophysal zone overlain by fractured middle nonlithophysal zone
E256	59+00	515147	App. B	Systematic	Systematic sample (1 bag); fracture with gouge (1 bag)
E257	61+00	515148	App. B	Systematic	Systematic sample

APPENDIX A (continued)

ESF SAMPLES COLLECTED FOR ³⁶Cl ANALYSIS,
FEBRUARY 1995 TO JANUARY 1997

LANL ID	Approx. ESF station	SMF barcode	Analytical status for ³⁶ Cl (see footnote 1)	Sampled feature (Preliminary)	Preliminary field description (see footnote 2)
E258	61+92	515149	App. B	Fracture	Large vertical fracture set
E259	62+00	515150	App. B	Systematic	Systematic sample, ~5 m N of fault trace at E260
E260	62+05	515151	App. B	Fault	Fault ~10 cm wide
E261	62+18	515152	App. B	Fault	Footwall of Ghost Dance Fault, highly fractured, large apertures
E262	62+71	515153	App. B	Shear	Intersecting shear/cooling joint sets
E263	63+00	515154	App. B	Systematic	Systematic sample
E264	63+06	515155	App. B	Fracture	156/84 fracture, ~ 10 cm wide; calcite-cemented breccia (1 bag); adjacent matrix (1 bag)
E265	63+21	515156	App. B	Fracture	Intersecting fractures with breccia
E266	63+26	515157	App. B	Fracture	Fracture/breccia zone, ~ 1 m wide, very broken up
E267	63+30	515158	App. B	Fault	Intersection of fault (30-cm offset) with vapor-phase parting
E268	65+20	515180	App. B	Fracture	Fracture zone
E269	63+73	515188	NA	Fracture	Fracture ~ 1m wide, with calcite filling
E270	63+81	515187	App. B	Fracture	Large fracture
E271	64+00	515186	NA	Systematic	Systematic sample with 2 intersecting fractures
E272	64+34	515185	App. B	Broken rock	Broken rock, no obvious structure
E273	64+50	515184	NA	Broken zone	Representative sample from broken zone ~ 35 m wide
E274	64+93	515182	NA	Fracture	Calcite in fracture below lithophysal cavity
E275	65+00	515181	App. B	Systematic	Systematic sample
E276	65+56	515179	NA	Fracture	Large fracture zone ~ 1.5 m wide
E277	65+80	515178	App. B	Fracture	Large 2-m wide fracture zone
E278	66+00	515177	NA	Systematic	Systematic sample with 2 intersecting fractures
E279	66+15	515176	App. B	Fault	Calcite-cemented fault breccia
E280	66+40	515175	App. B	Fault	Fault zone in TSw with about 2-m offset
E281	67+00	515174	App. B	Systematic	Systematic sample in nonfaulted, nonwelded unit
E282	67+20	515183	NA	Damp zone	Large wetted zone in poorly to nonwelded tuff
E283	67+27	515172	App. B	Fault	Fault in high-porosity zone of nonwelded tuff, wetted appearance
E284	67+35	515173	NA	Unit contact	Welded/nonwelded contact
E285	67+73	515171	App. B	Damp zone	Damp sandy zone (nonhorizontal) in PTn
E286	67+87	515133	App. B	Fault	About 3-m wide fault in Tsw: fault gouge (1 bag); calcite-cemented gouge (1 bag)
E287	67+87	515134	App. B	Fault	Sandy fault breccia
E288	67+90	515132	App. B	Fault	Footwall east of fault zone sampled by E286 and E287
E289	67+61	515170	App. B	Fault	Fault breccia/gouge (sandy to clay consistency)
E290	59+98	521128	NA	Systematic	Note limited availability of air hose prevented sampling exactly at Station 60
E291	68+63	521126	NA	Fracture mineral	Calcite/opal fracture minerals for mineralogic examination (not collected for ³⁶ Cl analysis)
E292	69+00	521123	NA	Systematic	Systematic sampling of TSw bedrock
E293	69+14	521122	NA	Fault	Fault gouge zone, ~0.3-m wide
E294	69+32	521121	NA	Fracture	Fracture, ~10-cm wide, containing gouge
E295	69+42	521120	NA	Fracture zone	Fracture zone, ~0.5-cm wide, with calcite + opal

APPENDIX A (continued)

**ESF SAMPLES COLLECTED FOR ³⁶Cl ANALYSIS,
FEBRUARY 1995 TO JANUARY 1997**

LANL ID	Approx. ESF station	SMF barcode	Analytical status for ³⁶ Cl (see footnote 1)	Sampled feature (Preliminary)	Preliminary field description (see footnote 2)
E296	Alcove #6	521129	NA	Fault zone	Sta 0+95 in alcove, ~3 m from Sundance Fault
E297	Alcove #6	521130	NA	Fault zone	Sta 0+99 in alcove, approx. at Sundance Fault
E298	68+00	521127	NA	Systematic	Systematic sampling of TSw bedrock

¹ Definition of codes for analytical status:

NA: Sample not analyzed (e.g., in queue for preparation, assigned low priority, or insufficient material for analysis)

App. B: Sample results are reported in Appendix B

Min. R&D: Only research and development (R&D) results are available for these samples of fracture minerals; a new laboratory procedure is being tested for this type of matrix.

Contam: Sample not analyzed for ³⁶Cl because the Br/Cl ratio measured in the leached salts indicated excessive contamination with construction water

Inconsistent results: Two aliquots of sample E027 that were believed to be physically identical to one another produced significantly different isotopic results. These data have not been included in this report. This discrepancy is under investigation.

² Field descriptions: Samples were collected by LANL staff unless this column indicates collection by the U.S. Bureau of Reclamation staff. Sample locations and descriptions are taken from documentation in field notebooks or on sample collection reports. This information is preliminary. USGS and LANL field geologists are systematically revisiting each site to develop fuller descriptions of the sampled features and to verify locations.